CRYSTIC® 15E(B)

High Performance Vinylester Brush Tooling Gelcoat

Introduction
Crystic Gelcoat 15E(B) is a thixotropic brush gelcoat specially formulated from a vinyl ester base resin and is available in a restricted range of colours. The information contained in this leaflet also applies to pigmented versions.

Applications
Crystic Gelcoat 15E(B) is designed for use in the manufacture of high quality, FRP composite tooling.

Features and Benefits
Crystic Gelcoat 15E(B) is heat resistant with high impact strength and good resistance to chemical attack. It is extremely resilient and can be polished to a high gloss.

Formulation
Crystic Gelcoat 15E(B) should be allowed to attain workshop temperature (18º - 20ºC) before use. Stir well by hand, or with a low shear mixer to avoid aeration, and then allow to stand to regain thixotropy. Crystic Gelcoat 15E(B) requires the addition of accelerator and catalyst to start the curing reaction. The accelerator must be thoroughly dispersed in the gelcoat. The accelerated gelcoat will remain stable at ambient temperatures (25ºC) for approx. one week. Shortly before use, the correct amount of catalyst should be added and stirred into the accelerated gelcoat. When catalyst is added to gelcoat that has been accelerated for several days, the pot life may be shorter than that of freshly accelerated gelcoat. The recommended catalyst is Butanox M50 (or other equivalent catalyst) which should be added at 2% into the gelcoat (please consult our Technical Service department if other catalysts are to be used). The catalyst should be thoroughly incorporated into the gelcoat, with a low shear mechanical stirrer where possible.

Pot Life
The pot life of Crystic Gelcoat 15E(B) with 3% Accelerator G and 2% Butanox M50 is 7-12 minutes at 25ºC. The pot life can be altered using different levels of Accelerator. The gelcoat, mould and workshop should all be at, or above, 15ºC before curing is carried out.

Application
Crystic Gelcoat 15E(B) is a tooling gelcoat and the application should be controlled at 0.5 - 0.6 mm wet film thickness. As a guide, approximately 500 - 750 gm^{-2} of gelcoat (depending on pigment) will give the required thickness when evenly applied. If left for prolonged periods, Crystic Gelcoat 15E(B) will cure to an almost tack-free finish, but this has no adverse affect on the adhesion of the backing laminate. If preferred, 2 coats of gelcoat can be applied to allow for any rubbing down which may be necessary during the life of the mould.

Additives
Crystic Gelcoat 15E(B) is supplied in a restricted range of colours. This eliminates the potential for mixing errors with small quantities of pigment paste. The addition of fillers or pigments can adversely affect the durability of the mould, in use.

Recommended Testing
It is recommended that customers test all pigmented gelcoats before use under their own conditions of application to ensure the required surface finish is achieved.

Typical Properties
The following tables give typical properties of Crystic Gelcoat 15E(B) when tested in accordance with appropriate SB, BS EN or BS EN ISO test methods.

Property		Liquid Gelcoat
Appearance		Yellowish, cloudy
Viscosity @ 25ºC		thixotropic
Stability in the dark @ 20 ºC	months	3
Gel time @ 25 ºC using 2 % Catalyst M (Butanox M50)	minutes	10

Property		Fully cured *Gelcoat (unfilled casting)
Barcol Hardness (model GYZJ 934-1)		45
Deflection Temperature under load† (1.80 MPa)	ºC	106
Elongation at Break	%	2.7
Tensile Strength	MPa	78
Tensile Modulus	MPa	3900

* Curing Schedule - 24 hrs @ 20 ºC, 3 hrs @ 80 ºC
† Curing Schedule - 24 hrs @ 20 ºC, 5 hrs @ 80 ºC, 3 hrs @ 120 ºC

Post Curing
For optimum life, a mould constructed using Crystic Gelcoat 15E(B) should be fully cured before being put into use. This can be achieved by placing the mould in an oven at 40 ºC for 30 hours. If this is not practical, the mould should be left in warm conditions (20 ºC) for 2 – 3 weeks prior to use. Where a mould is likely to experience severe conditions (eg due to high exotherm temperatures within backing laminates), it should be post cured at an elevated temperature. Contact our Technical Service department for advice.

Mould Release System
When a new mould is manufactured, traces of residual monomer (styrene) remain within the tooling gelcoat. Although post curing at 80 °C will reduce this to an insignificant level, exposing a new mould to this temperature is not always practical or desirable. The first release from a new mould is, therefore, likely to be the most difficult, particularly if a mould which is not post cured is subjected to elevated temperatures during its initial use. These temperatures could arise from the exotherm of the laminate contained within the mould, or from the mould itself being passed through a heated curing area during use. The following procedure was developed to combat release problems on new moulds manufactured and cured at workshop temperature (18 °C – 20 °C). It demonstrates an excellent release performance on new moulds and is equally effective on moulds of any age:

1. Before first use, allow the mould to mature for a minimum of 7 days at 18 °C or above.
2. Clean the mould thoroughly with Frekote PMC.
3. Apply 2 coats of Frekote FMS (mould sealer), allowing a minimum of 10 minutes between coats.
4. Apply 4 coats of Frewax, allowing a minimum of 10 minutes between coats.
5. Optional – apply 1 coat of a hard wax such as Mirrorglaze. This will reduce any tendency to de-wet or pre-release when the mould is used.
6. After the first release, use a masking tape test to check that the release agent remains on the mould surface. If so, apply 1 coat of Frewax or a hard wax. If not, repeat steps 2 to 4.
7. Continue as 6 until the release performance becomes predictable and easy then re-apply 1 coat of release agent as and when required.

Storage
Crystic Gelcoat 15E(B) should be stored in its original container and out of direct sunlight. It is recommended that the storage temperature should be less than 20 ºC where practical, but should not exceed 30 ºC. Ideally, containers should be opened only immediately prior to use.

Packaging
Crystic Gelcoat 15E(B) is supplied in 25 kg containers.

Health and Safety
Please see separate Material Safety Data Sheet.

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